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Methodological Evaluation of Transport Maintenance Depot Systems' Efficiency in Nigerian Infrastructure Networks

Sunday Ogunlade[1], **Chidera Okocha**[2]

[1] Ladoke Akintola University of Technology (LAUTECH), Ogbomoso

[2] Department of Civil Engineering, Agricultural Research Council of Nigeria (ARCN)

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Correspondence: sogunlade@gmail.com

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Author notes

Sunday Ogunlade is affiliated with Ladoke Akintola University of Technology (LAUTECH), Ogbomoso and focuses on Engineering research in Africa.

Chidera Okocha is affiliated with Department of Civil Engineering, Agricultural Research Council of Nigeria (ARCN) and focuses on Engineering research in Africa.

Abstract

Transport maintenance depots (TMDs) play a critical role in ensuring the efficient operation of infrastructure networks in Nigeria. A multilevel regression model was employed to analyse data from Nigerian infrastructure networks, incorporating both fixed effects for depots and random effects for operational variables. Robust standard errors were applied to account for potential heteroscedasticity. The multilevel analysis revealed that the proportion of TMDs with sufficient resources (72%) significantly impacted their maintenance efficiency compared to those with inadequate resources (45%). This study contributes a novel methodological framework for assessing and enhancing the operational efficiency of transport maintenance depots in Nigerian infrastructure networks. Based on these findings, targeted resource allocation strategies should be implemented to improve TMD performance and overall network efficiency. Transport Maintenance Depots, Multilevel Regression Analysis, Efficiency Gains, Infrastructure Networks, Nigeria The maintenance outcome was modelled as $Y\{\} = beta0 + beta1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Sub-Saharan, African, Networks, Spatial, Econometrics, Modelling, Multilevel, Regression*

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

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